



A Training of Trainers Course for IPM Farmer Trainers

Sumenep District, East Java

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(Excerpts)

by

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TRAINING ACTIVITIES

Activities	Time
Written Pre-test	60 min.
Introduction and Learning Contract	90 min.
Characteristics of the Ideal Trainer	90 min.
"What's this?" Special Topic	75 min.
Basic Ecosystem	150 min.
Ecosystem Analysis	190 min.
Nursery bed	30 min.
Ballot Box Pre-test	60 min.
Aquatic I	30 min.
Experiential Learning Cycle	75 min.
Participant Feedback	30 min.
Predators and Nursery bed Special Topic	180 min.
Root and Vascular System Special Topic	210 min.
Group Dynamics: Massage	15 min.
Response to Participant Feedback	45 min.
Rat Population Development	180 min.
Insect Zoo	75 min.
Group Dynamics: Group Singing	20 min.
Using the Quality Matrix	85 min.
Production analysis	25 min.
Pest and Disease Prevention	165 min.
Group Dynamics: Leading the Blind	80 min.
Making an Insect Collection	135 min.
Participant Feedback	30 min.
Field School Preparatory Meetings	105 min.
Aquatic Observation II	180 min.
Farmers as Organizers	120 min.
Science and Farmer	50 min.
Group Dynamics: Broken T	50 min.
Preparing for the Ballot Box	55 min.
Insect Life Cycles II	60 min.
Written Post-test and Ballot Box	125 min.

DAY ONE

The Opening Ceremony (08.00 to 08.45)

Learning Contract

This session started with a discussion of what constitutes a “learning contract”. Next the trainer and participants reviewed the schedule of TOT which had already been handed out to participants. Trainers and participants agreed on the timing of activities and the overall schedule of the TOT. TOT activities were explained by the trainer and questioned by the participants. In the end there was a general agreement on the curriculum. At this point the Field Leader 2, Wito, took over.

The Field Leader 2 led a discussion regarding the goals of the TOT. Participants looked at the TOT as an opportunity to:

- expand their agricultural knowledge;
- learn more regarding pest control without using pesticides;
- meet and make new friends;
- expand the impact of IPM;
- exchange experience;
- increase all farmers’ incomes.

The next question put to the participants by the Field Leader 2 was how to achieve these goals? This question precipitated a discussion that resulted in participants and trainers jointly agree to TOT goals and to:

- study hard
- keep to the schedule
- maintain order
- work together

Ice Breaker: Introductions

This was done outside the classroom. All participants and trainers stood in a large circle. Every one had to present some information about them including name, address, marital status, hobby, and name of their Farmers Group and the address of their group. The session ended with participants yelling "Glory to IPM".

Participant Leaders Election

To help insure that there were good communications between trainers and participants, the participants were asked to select two persons to represent them on the trainers committee. Gunawan and Maadin were selected.

Determination of Participant Groups

Participants were divided into five small discussion groups. These groups would be used throughout the TOT.

- Group I: Muslimah, Husnadinata, Samsul Arifin, Suryadi, Nawawi. Nawawi, Sritarjono.
- Group II: Uswatun, Gunawan, Moh. Zalil, Nursiman, Suwarno, Murohman
- Group III: Muchlis, Zakaria, Muh. Hamaludin, Murtala, Muhari
- Group IV: Maahfud, Asmoro, Imam Ghozali, Masruji, Abdul Junaedi
- Group V: Ridwan, Achmad, Zubairi, Marsidi, Maadin.

Written Pre-test

This written test was done to determine the participants' knowledge of IPM issues. Their test consisted of 20 multiple-choice questions and 10 essay questions. Questions focused on the basic principles of IPM, training, pesticides, etc.

Ideal Trainer

Participants were divided into five small groups. Each group was asked to brainstorm the characteristics of the ideal trainer and to draw that ideal trainer. Each group then presented their pictures and discussed the characteristics of an ideal trainer. In summary the trainers stated that the ideal trainer:

- goes into the rice field with the participants
- is patient and honest
- has a broad perspective
- is polite, active, and attentive
- displays a high level of discipline
- respects others opinions
- is highly motivated, flexible, tactful, and understanding

“What is this?”

The trainer first explained why the “what is this?” activity was created, the goal of the activity, and how to establish a dialogue. All participants then practiced the activity. Using materials in the classroom such as paper, pens, erasers, etc. each group practiced using the “what's this?” learning dialogue. The trainer of this session explained that it was hoped that each participant would play both roles of questioner and trainer.

At the end of the session, the trainer asked participants about how they felt using this dialogic process. Participants said that they enjoyed the process. They found it satisfying to be able to help others discover what they needed to know.

DAY TWO

Basic Ecosystem

The trainer explained the goal and the process that would be used in the special topic, “the basic rice ecosystem”. Participants were divided into five groups. Each group had to choose a person to act as a Farmer IPM Trainer who was to train the others in the group. The participants who were acting as trainers used the Fieldguide for this special topic to help them conduct their practice session. The participants, acting as trainers, explained the objectives of this special topic and the steps that would be followed to achieve those objectives. After that, the groups went down to the field to make field observations of plants, pests, natural enemies, weeds, and other elements of the ecosystem. When they finished with their observations they made pictures of what had been observed in field. Following this the groups discussed the relationships that could be found in the rice field ecosystem. Some groups only saw the relationships among a few elements such as the plant and pest. Other groups discussed the energy flows found in the ecosystem. One of the groups discussed questions found in the guidelines: What if a pesticide killed all insects and spiders? What would happen? What would happen if plants became resistant to pests and there were no pests in the field? What happens if there are high levels of fertilization during the dry season? What would happen if there were low rates of fertilizer applications during rainy season? Why is it important to have healthy plants? What preserve natural enemies? Why do we need to observe rice-fields weekly?

By the end of the session the participants came together again and the trainer summarized the elements in the rice ecosystem and then described their relationships. This session ended with an evaluation the participants who had facilitated the activity. The “Itemized Response Analysis” was used for the evaluation. The following is an example of how this analysis was done.

What was good about the trainer’s approach?	What needs improvement?	How to make the Improvement?
Made good explanations	-Sometimes did not aim at the material and objectives. The background was unclear.	-Focus more on activity objectives. Ask for questions.

Ecosystem Analysis

Participants were divided into five small groups. Each group appointed one of its members to be the trainer. Participants who had been chosen as trainers described the background, objectives, and procedures of the agro-ecosystem analysis. There was variation among the “trainers” as they conducted their sessions. Some trainers gave brief explanations and then went to the field to make their ecosystem observations. Others spent too much time on the objectives and procedures. In general the groups looked like groups in an IPM Field School.

In one group there was a long discussion concerning the concept of "balance" among the populations of pests and natural enemies. What was the meaning

of a system in balance? What conditions could be said to be in "balance"? These questions confused the participants. Some of them knew all about natural enemies, but they were not able to relate the natural enemies to the pests in terms of predation rates. The discussion on the method to be used to describe pest damage levels also took a long time. The participants relied on general estimates. The leader of the session, Supadi, wanted participants to use a simple basic scale. At last they agreed to use a scale of one to four to describe damage levels. In the end participants thought it easier to use a scale of one to ten. Some comments that came out regarding "trainers" as a result of the Itemized Response Analysis:

What was good about the trainer's approach?	What needs improvement?	How to make the improvement?
Language was clear and simple.	Way of explaining.	More practice in training, Better understanding of method and material will improve explanations
Polite approach	Unfocussed	Mastery of material.

The Nursery Bed

This session was presented to help participants to increase their awareness of pests and natural populations in the nursery bed. Participants were divided into five groups. Each group observed a nursery bed of 2.5 m X 2.5 m and collected pests and natural enemies in a plastic bag. Results of this observation were to be discussed on the following day.

Ballot box: Pre-test

The participants conducted a Ballot Box Pre-test with the help of the trainers. The questions used in this session concerned pests, natural enemies, and disease. There were 25 questions, but there were 30 persons in the TOT. This meant that some of them had to wait their turn to answer questions. There should be the same number of questions (and hence "ballot boxes") as participants. Thus there would be only one participant in front of each ballot box. The TOT trainer team conducted this test.

Aquatic I

Participants were divided into five small groups. Each group placed mud from the seedbed in a plastic jar. The jars would be observed and discussed on the next to last day of the TOT.

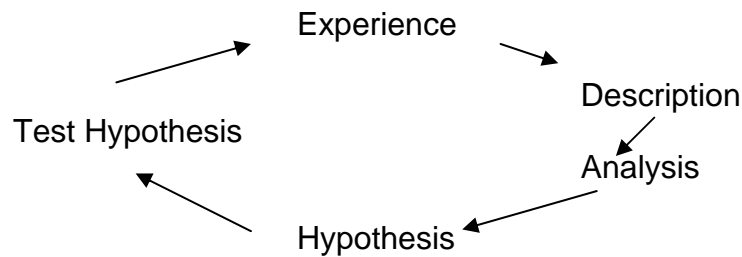
Reflection

The aim of this session was to have participants review what had been learned during the two days and make suggestions regarding the TOT. Participant comments/suggestions included:

- Identify a method for measuring rates of plant damage.

- What was the reason for discontinuing the used of pesticides? Was it based only on economic analysis?
- “Phase” needed a better description.
- The material on the "guiding the blind" exercise needed to be explained.
- Trainers should avoid using terms from foreign languages.
- The way to make a ballot box needed to be explained.
- Trainers needed to keep on schedule.

The Experiential Learning Cycle



The purpose of the “Experiential Learning Cycle” activity was to clarify the steps passed through by participants as they experienced the "learning by doing" approach used in Field Schools. Trainers hoped that increased clarity would help the participants to better employ this approach. Participants suggested that the words used to portray the concept were less than clear. They suggested that instead of saying “experiential learning cycle” it would be better to use simpler terms. One example of a clearer term was: “Field School Learning Process”.

Collecting Note Books

Note books of all participants were collected and checked by the trainers team. This monitoring was needed to see what mistakes might have been made by participants as they took notes. With the first check, trainers found some mistakes in the definitions of pests and diseases. Those mistakes were examined during class to make sure that all participants understood the definitions.

DAY THREE

The Importance of Predators in the Nursery Bed

The leader began by describing the situation in the nursery bed. The participants, in small groups, then discussed the situation in the nursery beds based on the field observations that they made yesterday and the samples of insects that they were able to collect at that time. The facilitator provided the participants with a set of questions to guide their analysis and discussion.

1. State the name and function of each insect that you found in the carbofuran treated bed and in the non-treated bed.

2. Of the insects that you found, per treated bed, how many were predators?
3. Assume that: a) the life cycle of spider is three months; b) fifty per cent of the spiders that you found are males and 50 % are females; c) each female is able to lay 30 eggs during her lifetime. given the number of spiders that you found in the nursery beds, how many spiders will there be in the third generation? What is the difference in the potential numbers of spiders in the carbofuran treated bed compared to the non-treated bed? Given the above how many spiders will there be per m² for each of the treatments? If you have a 10 m² nursery bed, how many spiders will be in that nursery bed if you apply carbofuran and if you don't apply carbofuran? If each spider is able to kill four pests per day, how many pests will be killed each day of each generation in the carbofuran treated bed and the non-treated bed?
4. What do you think about the impact of the use of carbofuran in the nursery bed?

Following the small group discussions, each group made a presentation of their results in a full plenary session. There was lots of discussion regarding some insects and whether they were pests or not, for example moths even though the moths do not damage the crop. The participants all reported that the questions regarding the population dynamics of spiders in nursery beds and the impact of their predatory capacities to be very interesting and useful.

Group Dynamics: Massage

This game was designed to release fatigue. Participants were divided into three groups (women formed a separate group). Each group formed up in a line. Each participant put his/her hands on the shoulders of the participant in front of him/her. Participants were asked to move his/her fingers about three minutes to massage the shoulders of the person in front of him/her. After that, every one turned around and massaged the shoulders of the person behind them.

Root and Vascular System Special Topic

The trainer explained the background, goal, and process of the special topic study. This study was done to clarify how systemic pesticides could enter plants and move inside the plants. After the trainer finished describing the procedures, participants did the study. The group was divided into five groups and each group given three plastic glasses. The glasses were filled with water to which had been added food coloring. A rice plant with its roots was put inside the first glass. A celery stick was placed in the second glass and a plastic straw was put in the third glass. An observation was made 90 minutes after the plants were put inside the glasses.

There were ten questions raised by the trainer for discussion the observation:

1. What happened after the food coloring reached the tips of the leaves?
2. How was the food coloring able to about the plant?
3. What do you think will happen when systemic pesticides are applied in the same system?
4. What kinds of pests were targeted by these pesticides?

5. How did pests attack the blades of leaves?
6. How do pests attack the vascular network of a plant?
7. What pests sucked the liquid of plants?
8. What if you looked at the blades of leaves every morning and afternoon?
9. How would the dissolved systemic pesticides effect natural enemies in the field?
10. What happened to farmers who walked barefoot in the fields during the day?

After discussing the questions and writing their answers on newsprint, a plenary session was held. The discussion was dynamic. There were interesting questions from the participants regarding the vascular system and systemic pesticides.

Response to Participant Feedback

After looking at the issues that came up during the participant feedback session, the trainers reviewed issues that the participants identified as needing clarification.

Group Dynamics: Making Pictures Together

This time participants were asked to draw pictures together. The session was conducted by a participant. The trainer explained the aim and process of the activity then all participants did the activity. Participants were divided into two groups, then each group made a picture. A participant could only make one line and had to keep the pen in contact with the paper. One group was allowed to discuss what they wanted to draw, the second had to draw in silence. At last both groups completed their pictures: the first group made a clear drawing of a house. The other group was unable to complete a drawing. The analysis of participants regarding the results of the session was clear. The poor drawing was a result of lack of communication. There had been no discussion or plan in the second group. The better drawing was a result of the group being able to communicate. The group concluded that to achieve a goal, a group required good communication and a clear plan. At the end of the session the trainer explained how to conduct this activity.

DAY FOUR

Rat Population Development

The trainer gave a short introduction for this special topic which included background, goals, and the process to be used. An explanation was presented on the life cycle of rats. A rat might live up to a year or more. Females will bear young around once every three months with six young in each litter and half of those young will be females. “Given this”, asked the trainer, “how many rats could be produced by a pair of rats and their descendents in one year?” To answer this question, participants were divided into five groups and given corn to simulate rats for the purpose of counting. One trainer assisted every small group. There was some confusion among participants as they tried to decide the month when a rat would be giving birth. Two groups arrived at the correct amount. The groups that had arrived at the correct answer presented their methods of calculating population growth among rats in a pleno session. The IPM Field Trainer then closed the session by reviewing the biology of rats and raising the following questions:

If unchecked, how many offspring could be generated by a pair of mice and their offspring in one year?

How many if there were 10 pairs of mice?

How can rats be controlled at the farm level?

Why is it important to control rats at the beginning of the season?

Insect Zoo

“Insect Zoos were developed to help Field School participants learn about pest and natural enemies through direct observation. The zoo can be made in the field, in a pot, in a plastic jar, or in a bottle.” Thus began the trainer’s discussion of insect zoos. He went on to explain how insect zoos could be used to study insects and how to build an insect zoo. Participants were divided into five groups, each group was given 4 bamboo sticks, plastic, and rice plants. Each group then made its own insect zoo. All of the groups were able to do this.

Review of Field Guides and Their Use

The trainer suggested that perhaps the participants felt clumsy as they facilitated the training. There were many ways to use the Field Guides depending on the situation. Then trainer then went on to discuss the various uses of the Field Guide.

Group Dynamics: Singing Together

This is an activity that can be used to relieve stress or to just have fun. The name of the song is “Ha He Ho”. The song can be sung quickly or slowly, loudly or quietly, competitively or cooperatively, with or without body movements. The trainer led the participants through the different alternatives so that they would be able to use the song in their Field Schools.

Quality Matrix

The Quality Matrix was presented to help participants understand how the activities in a Field School should be implemented. For example, the process "what's this?" can be broken down into several key steps that must be done if the process is to be of high quality. After the explanation of the trainer, the participants were divided into five groups, each group had to analyze the steps in the agro-ecosystem activity according to sequence, action to be implemented by the trainer, and important points regarding that action.

Production Analysis

A simple production analysis can be done at a Field School by counting the cost of inputs (including labor) and attaching a value to the yields of the IPM and non-IPM plots at a Field School. By comparing these two treatments we can estimate the economic benefit of implementing IPM. In the case that was presented, the costs of the two treatments were the same for all inputs except pesticides which were not used in the IPM treatment. The yield was higher in the IPM plot. Hence a benefit could be shown for using IPM in this case. A participant asked how was IPM compared with "no-till cultivation"? Which would have lower costs? The trainer answered that he had never tried to make the comparison.

DAY FIVE

Pest and Disease Prevention

Ecosystem Element	Management Action	Positive Impact	Negative Impact	When to Implement
The rice plant	plant in straight rows at distances of at least 22 cm x 22 cm use proper variety, use healthy plants	increased number of tillers	improved varieties more expensive	At planting
Water field	dry up the	the insect is unable to develop	plants when suffer due to there are dryness, may lower yield	symptoms of pest attack
Natural enemies	increase the #'s of natural enemies by not spraying	could kill pests		from beginning of season

This session was opened by the trainer with an explanation of the goal of learning about pest and disease prevention. He reviewed ecosystem elements

and described the way the elements interacted and could thus be used to manage the ecosystem for pest control. He presented a matrix (see below)

to help in the analysis of the ecosystem regarding various pests. After dividing participants into five groups, the trainer gave each group a problem to analyze and solve. “Group I” worked on leaf folders, “Group II” on stem-borers, “Group III” on rats, “Group IV” on grasshoppers, and “Group V” on rice seed bugs. Following is the result of the discussion of “Group I”:

Leading the Blind

The trainer opened this session by explaining the aim of the game, then divided participants into two groups. Participants in “Group I” were blindfolded, those in “Group II” were to be the guides for the “blind”. The “guides” led the “blind” around, describing where they were going and where the “blind” would be walking. The groups were asked to answer the following questions.

- How did you feel when guiding?
- What did you do while guiding?
- Did you look for easy things to do with the ones you guided?
- Did you look for hard things to do with the ones you guided?
- Were you careful?
- Did you describe the surrounding where you were walking?
- Did you often let the blind move about freely?
- How did you feel when your eyes were blindfolded?
- What was the most interesting experience when your eyes were covered?
- How did you feel about the guide?
- Were you suspicious? Why?
- Did you feel that you were well taken care of by the guide? Prove it!
- Did you feel that you were being made a fool? Give examples!

After finishing their discussions, they presented their results in front of the class room. The trainer summarized participants comments by describing what was as good guide based on the answers to the above questions. According to participants , a good guide would not let the blind take chances, the guide would give clear explanations, would not be threatening, etc.

Insect Collection

The trainer explained the purpose for making a collection and the kinds of insects to be collected. He also explained that the intention of this activity was to learn about insects and their functions. He then showed two approaches to collecting (i.e. wet and dry collections). A wet collection is made by putting insects in a bottle filled with alcohol of 70%, then attach a piece of label to the bottle with the name of the insect, the name of the collector, the place collected, and the date the insect was collected. A dry collection is especially appropriate for bigger insects such as grasshoppers, dragon flies, beetles, and butterflies. This kind of collection is made by mounting the insects on needles and placing the needles into a tray or box so that the insects are off the bottom of the box. Labels should be placed under the insect. Labels would contain the same

information as the wet collection labels. After finishing the explanation, the trainer divided participants into five groups and took them to the field to look for insects. The activity will be continued by making collection boxes and setting the insects into the boxes.

Participant Feedback II

The aim of this reflection was to see whether participants still had certain materials which were unclear to them. Issues raised in this session included:

- What was meant by a reciprocal relationship between the sun and plants?
- How can you determine the average rate of growth for a rat population?
- What was the purpose of the “leading the blind” activity?
- How to guarantee that female trainers will be respected?
- Was there any influence of moonlight and starlight on plant development?

The Field School Preparation Meeting

Since there was not enough time, the discussion of this meeting was not followed by a practice session. This activity was basically a theoretical discussion. The issues discussed were:

- Where should the preparation meeting be held?
- Who should attend the preparation meeting?
- What should be discussed in the meeting?
- What was the purpose of the meeting and the activities to be conducted during the meeting?

DAY SIX

Aquatic II

Aquatic II was the continuation of the same material discussed on the second day. In the second day, participants only took mud and plants from the nursery bed. During this session they made observations of their bottles and discussed what they observed. After a brief explanation, participants were divided into five groups as in the second day, then the trainer asked the following questions:

1. What kind of insects are found in the aquatic habitat?
2. Which ones are pests, natural enemies, plankton, decomposers, plankton eaters?
3. What kinds of insects are living in the water?
4. How was the variety of natural enemies, pests and decomposers?
5. Explain how stem-borer larva could be eaten by water predators.
6. What was the effect of "furadan" on the rice field?
7. How can the field be managed to support beneficial water insects?

A presentation of their answers was made by each group.

Trainer as Organizer

This session was opened by discussing the function of an IPM Trainer as an organizer using a car as an analogy. First the components of a car were identified. This resulted in a list of 41 car components. Next the trainer asked participants to analyze the function of each component in terms of a Farmer IPM Trainer. Since there were many car components mentioned, the trainer limited his discussion to a few of the more important components in a car, for example the accelerator. Participants concluded that as an organizer, a Farmer IPM Trainer had to be able to plan, implement, and evaluate activities as well as motivate people.

Science

The trainer started this session by presenting a discussion about the science. He discussed the differences between technology and science. The group analyzed the characteristics of science and technology. There was then a more detailed analysis of the “scientific method”. Next the trainer presented some ideas connected to the implementation of field studies. The first issue concerned the use of repetitions in field studies. The second concerned measurement of trends other than “average”. The session was the first step in helping Farmer IPM Trainers to develop as researchers. In the monthly Farmer IPM Trainers Technical Workshop, the issue will be taken up again.

Group Dynamics: Broken T

The aim of this activity was to learn about the strengths and weaknesses of various communication techniques. Participants were paired off, one was to be the trainer and the other a Field School participant. The trainer of this session gave the “Broken T” (a large letter “T” that had been cut into pieces) to the participant who acted as the trainee and gave the answer key to the participant who acted as the trainer. The game ran as follows:

First Game:

The trainer was not allowed to give an explanation, the trainee was not allowed to ask. If the trainee could take the pieces of paper and make a T, he had to report to the trainer. Time allocation was five minutes. In this first game, there was not any participant could arrange the pieces of paper to form the letter “T”.

Second Game

The trainer was allowed to explain the way of arranging the paper to form T letter, but participants were not allowed to ask clarification questions. Time allocation was 5 minutes. Once again the trainees could not finish their job.

Third Game

The trainers and trainees were allowed to work together to form a “T”. When a pair had finished the job, they had to yell IPM! Time allocation was 5 minutes.

By the end of this session, the trainer reviewed the game. The first and second games did not run successfully, but the third was done well. Why did this happen? The first and second games could not be finished because there was no or limited communication. The third game was successful because there

was coordination, information, and communication. The summary of the participants was:

1. Coordination between trainers and participants helped to achieve the goal.
2. In doing activities, there should be good group communication.

Making the Ballot Box Test

The process was started by explaining the function of a ballot box. Next the group discussed the kinds of questions to be used in the Ballot Box. The group was able to generate a lot of questions by brainstorming. Next the participants were divided into five groups, each group was asked to make a ballot box with the questions with the questions that they had identified. This was not easy, but the participants were successful. The trainer summarized what had taken place and provided some more pointers on developing questions for the Ballot Box Test. At the end of the session, the trainer asked what were the basic requirements of questions to be used in a Ballot Box Test. Participants identified three important points.

1. The questions should be field and skill based.
2. No foreign language or academic terms were to be used.
3. Questions should refer to the functions of rice field insects.

Farewell Night

This program was done because participants wanted to make a farewell night. This "arts" night consisted of songs, jokes, dancing, and poetry reading. All activities were created by the participants.

DAY SEVEN

Written Post-test

This written test was conducted to determine whether participants had increased their IPM knowledge during the training. The questions used in this test were the same as the ones used in the pre-test.

Ballot Box Post-test

The questions used in this Post Test were the same as the ones used in the pre-test. This test was made to measure the skill of farmers in identifying pests and natural enemies.

Insect Life-cycle

This activity was as additional program because the committee felt it important to review this concept.

Closing
